

# **Oracle® Warehouse Management Cloud**

Integrating with Integration Cloud Services

Release 9.0

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Oracle® Warehouse Management Cloud Integrating with Integration Cloud Services, Release 9.0

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## Preface

This document describes configuring and customizing *Oracle Warehouse Management System (WMS) Cloud* to integrate with another product using the *Integration Cloud Service (ICS)*.

### Change History

Date	Document Revision	Summary of Changes
05/2018	-01	Initial release.

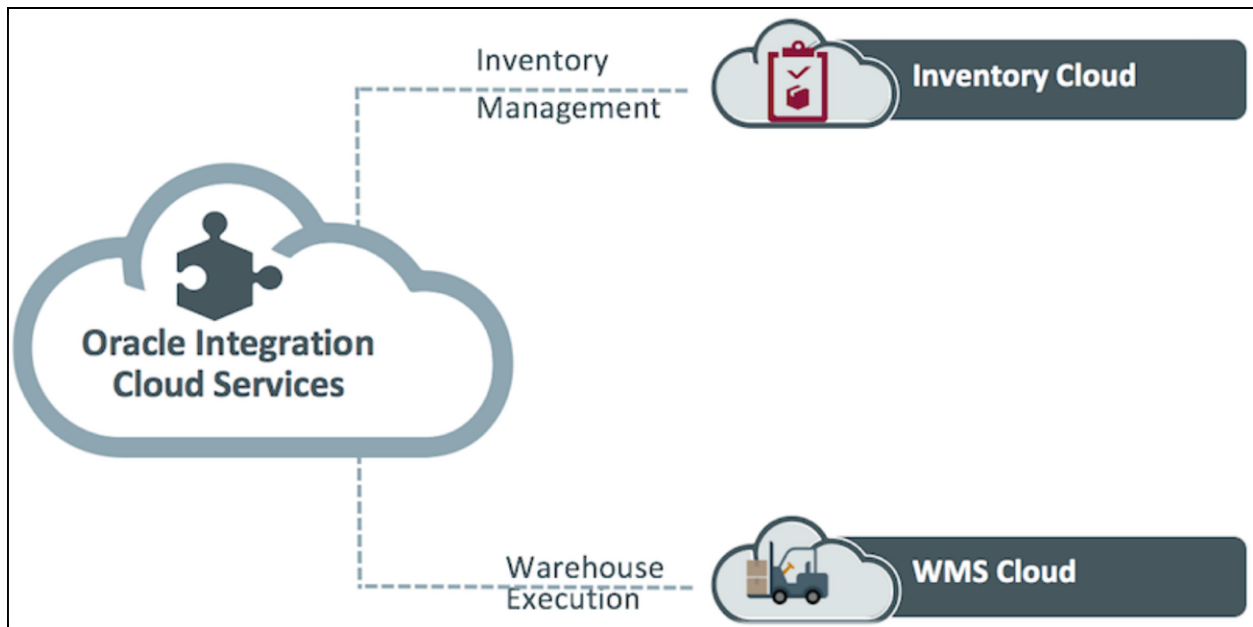
# 1. Overview

This document describes a sample integration between Oracle Warehouse Management System (WMS) Cloud and Oracle Enterprise Resource Planning System (ERP)/Supply Chain Management (SCM) cloud via Integration Cloud Service (ICS). The sample integration can be obtained from My Oracle Support (MOS): [Sample Integration Between Oracle WMS Cloud and Oracle ERP Cloud \(Doc ID 2404671.1\)](#). For more information on Integration Cloud Service, refer to:

<https://cloud.oracle.com/integration>

**(Note:** This sample flow is built for ICS. Oracle Integration Cloud (OIC) supports importing ICS sample flows and ICS-based sample flows should be backward compatible. However, these sample flows have not been tested using OIC).

The standard REST adapter included with ICS is used to create an ICS Connection to a specific Oracle WMS Cloud instance. The ICS Connection can then be used to create an Integration which calls Oracle WMS Cloud web services, as well as exposes web services that Cloud WMS can call to push data out. The sample flow uses the [ERP Cloud Adapter](#) available in ICS to connect to ERP Cloud instances (Fusion/Cloud Inventory).



**Figure 1: Sample Flow**

## 2. Configuration

### Authentication

Cloud WMS requires a user with specific permissions to be configured to use the REST APIs. Please refer to the [Integration API Guide](#) for details. This user must then be configured on the connection created in ICS.



## ERP Cloud Adapter

[ERP Cloud Adapter](#) access must be activated on the Oracle Inventory Management Cloud instance. More details on the ERP Cloud Adapter can be found [here](#):

## ICS Versions

The minimum supported ICS version is 18.2.3.0.1.

## 3. Sample Integration between Oracle WMS Cloud and Oracle ERP Cloud

### Overview

The sample integration can be obtained from My Oracle Support (MOS): [Sample Integration Between Oracle WMS Cloud and Oracle ERP Cloud \(Doc ID 2404671.1\)](#). This shows one way an integration might be built between Oracle WMS Cloud and Inventory Management Cloud. In these sample integrations, Oracle WMS Cloud leverages Oracle Inventory Management Cloud to integrate to Oracle Purchasing Cloud, Oracle Order Management Cloud, Oracle Cost Management Cloud, Oracle Install Base Cloud, etc.

After importing the sample integrations, configure the following:

1. Connection information in ICS for the source and target systems
2. Authentication as described above for ICS to call Cloud WMS REST web services
3. ERP Cloud Adapter Web services as described above for Logistics Cloud to call ICS

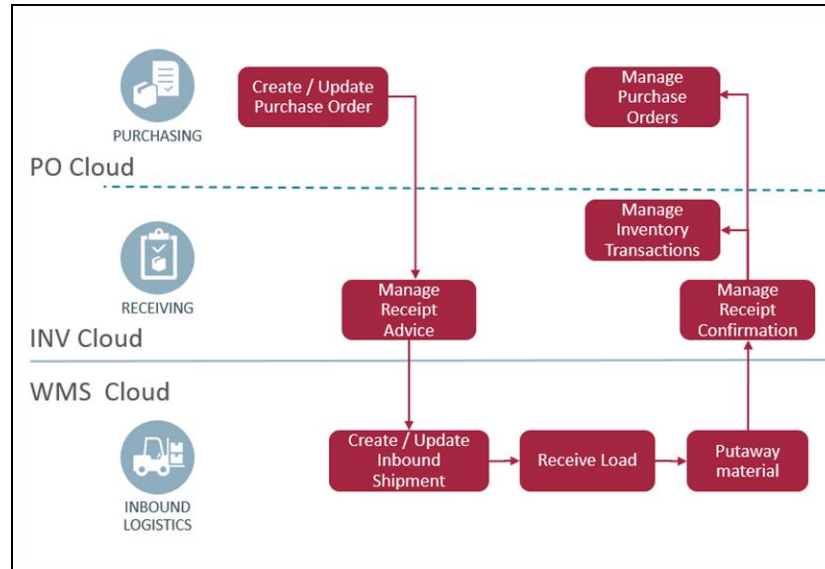
Implementers will also have to configure automation as described below.

The diagram below illustrates the flow of the sample integration (details below).

### Supported Transactions

Business Process Flow	Transaction Type
Inbound Logistics	Purchase Order Receipt
Inventory Operations	Inventory Adjustment
	Cycle Count Adjustment
Outbound Logistics	Sales Order Shipment

## Integrated Inbound Logistics

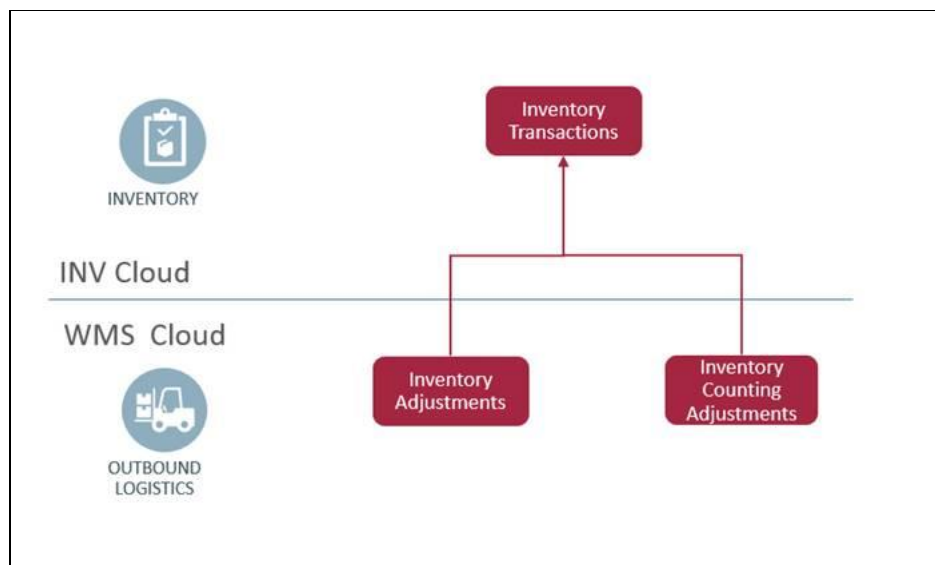


**Figure 2: Integrated Inbound Logistics**

- Receive purchase orders based on receipt advices
- Receive and putaway inbound shipments and send receipt confirmations to INV Cloud
- Send received actuals to INV Cloud including lot number, serial number, and license plate number information for product genealogy

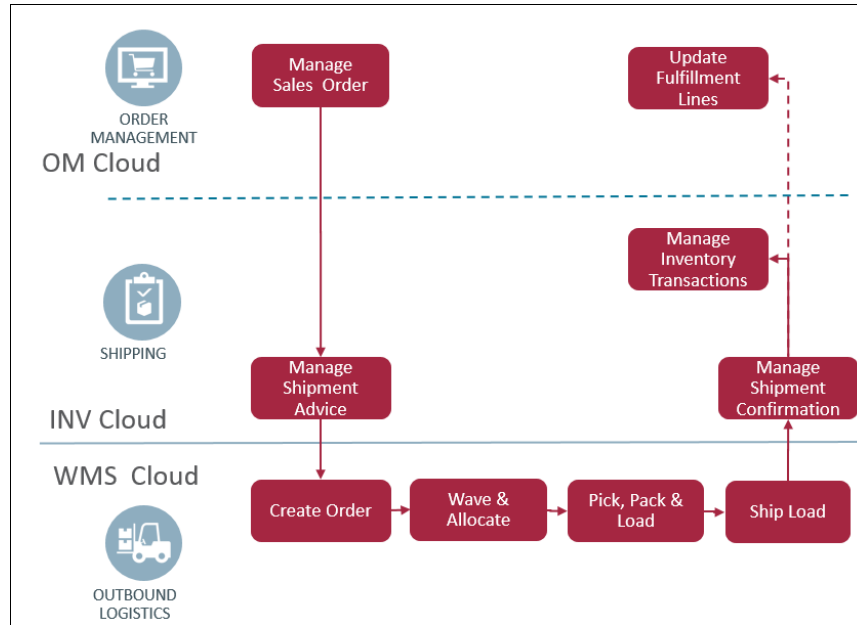
## Integrated Inventory Operations

- Send inventory adjustments and inventory counting adjustments to INV Cloud to manage inventory operations
- Send adjusted quantities including lot number and serial number



**Figure 3: Integrated Inventory Operations Flow**

## Integrated Outbound Logistics



**Figure 4: Integrated Outbound Logistics Flow**

- Create outbound warehouse orders based on received shipment requests
- Wave & allocate, pick/pack/load, ship loads and send ship confirm to INV Cloud
- Send shipped actuals to INV Cloud including lot number, serial number, and license plate number information for product genealogy

## Assumptions

In the same flow mapping the following values are hardcoded and can be modified by customers:

- SourceCode - "Cloud WMS"
- ProductCode - "INV"
- Adjustments
  - TransactionMode - "3"
  - validationLevel - "1"
- Shipment Request
  - order\_type - "SALESORDER"
  - seq\_nbr - "1"
  - company\_code - "PP" (ParentCompanyCode - "PP")
    - This should be changed by the customer to match the company code in use
- Receipt Confirmation UOM: Each
- In Oracle Purchasing Cloud, there should be two sub inventories 'Received' for received inventory and 'Stores' where inventory is putaway.
- While receiving in WMS we apply PP Lock code on LPN in order to make sure the inventory is un-allocatable and this gets removed on putaway.
- In Purchasing Cloud, PO's can be created in three different receipt routing methods – Standard, Direct and Inspection. Standard receipt needs to be used for this sample flow integration.
- Inventory adjustment before putaway in WMS will not reflect in Oracle Inventory. All adjustments reflects after putaway of inventory.
- Inventory rejected due to Quality Check in WMS will not adjust the 'Received'
- Item revisions are not supported in WMS. The assumption is that the latest revision is used.

- The sample integration includes standard items and items that are lot controlled, serial controlled, or lot and serial controlled.

### **Features not included in the sample integration:**

Some of the Oracle SCM Cloud and Oracle Warehouse Management features that are not included in the sample integrations include:

#### **Product Definition (Item Definition)**

- Items with Revision control
- Standard and configured Pick-to-order (PTO) kits
- UOM class of weight, length, volume – the sample integrations were designed for items with a Primary UOM of Each

#### **Oracle Inventory Management Cloud**

- Supplier Lot Number
- Supplier Serial Number
- Project inventory transactions
- Material status
- Contract Manufacturing flows
- Fiscal document generation (Brazil)

#### **Oracle Purchasing Cloud**

- Consigned inventory from supplier
- Purchase orders for items with an expense destination

#### **Oracle Order Management Cloud**

- Ship sets on sales orders
- Sales orders for parcel carriers

#### **Oracle Warehouse Management Cloud**

Multiple Companies in a single Facility – Oracle INV Cloud does not support managing the inventory of multiple Companies in a single Facility. For 3PL clients managing multiple Companies in a single Facility, separate Inventory Organizations should be defined in Oracle INV Cloud to for each Company in a Facility. The sample integrations would need to be extended for these use cases.

### **Known Issues:**

Some of the Oracle SCM Cloud and Oracle Warehouse Management features/use cases with known issues or limitations to the integrations that can be built include:

- Cross docking use cases – Oracle INV Cloud is not currently able to send a shipment request until inventory has been reserved at the item level for a sales order. Therefore, Oracle WMS Cloud would not have the needed visibility to the Oracle OM Cloud sales order to be able to know to cross dock received material over to the shipping area.
- Items that are not quantity tracked and/or have expense destination. Oracle WMS Cloud always tracks the quantities of items.
- Oracle WMS Cloud supports scanning a single lot number.
- Oracle WMS Cloud supports scanning a single Serial number.
- Automatic change management of sales orders after Oracle INV Cloud communicates the Shipment Request to the WMS.

## Product/Item Integration

The sample flow does not handle item integration. This can be done using support WMS web services.

## Sample Integrations

### OCWMS Receipt Advice from ERP

This integration takes purchase order Receipt Advices in Oracle Inventory Management Cloud and maps them to Oracle WMS Cloud Purchase Orders. It makes use of the business event for the INV Cloud Receipt Advice that after Receipt Advices are created in Oracle INV Cloud, then they get “pushed” to Oracle WMS Cloud. Configuration is required in Oracle INV Cloud for this to happen automatically. The Oracle INV Cloud Receipt Advice can send changes and Oracle WMS Cloud can accept changes to expected receipts until the receiving process has begun. All lines having the same Document Number (Fusion PO number) are grouped into one WMS PO. The document number also becomes the WMS PO number.

REST Endpoint service configuration to process PO to WMS:

[https://<cloudwmsdomain>/lgf\\_env\\_name/wms/api/init\\_stage\\_interface/](https://<cloudwmsdomain>/lgf_env_name/wms/api/init_stage_interface/)

### OCWMS Receipt Confirmation to ERP

WMS Receipt Confirmations mapped to Fusion receiving. Scheduled Job and Output interface configuration in WMS is required to ensure that relevant inventory history records are sent to ICS.

REST Web Service configuration in WMS to post the receipt activity to ICS.

[https://<icsdomainname>/integration/flowapi/rest/OCWMS\\_RECEIPT\\_CONFIRMATION/v01/receipt\\_confirmation](https://<icsdomainname>/integration/flowapi/rest/OCWMS_RECEIPT_CONFIRMATION/v01/receipt_confirmation)

### OCWMS Shipment Request from ERP

Shipment Requests from Fusion Shipping mapped to WMS Orders. Each Shipment request line is mapped to a WMS order with one detail line. It makes use of the Fusion shipping cloud event system so that when shipment requests are created in shipping, they get “pushed” to WMS. Configuration is required in Fusion Shipping cloud for this to happen automatically

In WMS, Output interface configuration screen needs to be configured with below REST web service to post the receipt message to ICS.

[https://<cloudwmsdomain>/lgf\\_env\\_name/wms/api/init\\_stage\\_interface/](https://<cloudwmsdomain>/lgf_env_name/wms/api/init_stage_interface/)

**NOTE:** Along with web service configuration, Inventory history activity code filter criteria is required to be configured to post required activity codes to Oracle Inventory through ICS.

### OCWMS Shipment Confirmation to ERP

Shipments out of WMS mapped to Fusion Shipping Shipment Confirmation. When loads get shipped out of WMS, this information is mapped to Fusion Shipping shipment confirmations. Scheduled Job and Output interface configuration in WMS is required to ensure that relevant data is sent to ICS.

In WMS, Output interface configuration screen needs to be configured with below REST web service to post the adjustment message to ICS.

[https://<icsdomainname>/integration/flowapi/rest/OCWMS\\_SHIPMENT\\_CONFIRMATI/v01/shipload](https://<icsdomainname>/integration/flowapi/rest/OCWMS_SHIPMENT_CONFIRMATI/v01/shipload)

## OCWMS Inventory Adjustment to ERP

WMS Inventory Adjustments to Fusion Inventory. Scheduled Job and Output interface configuration in WMS is required to ensure that relevant inventory history records are sent to ICS.

In WMS, Output interface configuration screen needs to be configured with below REST web service to post the adjustment message to ICS.

[https://<icsdomainname>/integration/flowapi/rest/OCWMS\\_INVENTORY\\_ADJUSTMENT/v01/inv\\_adj](https://<icsdomainname>/integration/flowapi/rest/OCWMS_INVENTORY_ADJUSTMENT/v01/inv_adj)

**NOTE:** Along with web service configuration, Inventory history activity code filter criteria is required to be configured to post required activity codes to Oracle Inventory through ICS.

## OCWMS Echo LgfData

This is used for internal XML transformation. No user configuration is necessary.

### Pre-requisites in WMS

- The supplier in the Fusion Purchasing should be created as Vendor in the WMS
- Items defined in Fusion Product Definition should be present in the WMS
- Lock Code should be configured in WMS for locking inventory during receipt
- Reason code should be configured to justify the reason for inventory adjustments
- Source Document Type in the oracle inventory should be created as PO Type in the WMS
- PO Type should be mapped with associated Shipment Type in WMS for Shipment over-receipt
- Sales orders are eligible for waving so on order type 'Wave Flag' should be set to Yes
- Ship via configuration should be present in WMS. Shipping methods in Fusion are a concatenation of Mode + Carrier + Service Level. The service level is mapped as the Ship Via Code in WMS.
- In IHT Activity Parameters screen, we need to enable split by serial nbr flag = Yes for history activity code 24 - Unlock Container - Before ASN Verification and 25 - Unlock Container - After ASN Verification for Serial controlled items.

### Schedule Job configuration in WMS

#### Configure

- Job Type - **Generate Inventory History Extract** with
- Schedule Type = **Crontab/Interval** based on operations need
- Enabled = Yes/No to enable or disable the job
- Include activity IDs list = Generates the Inventory History file for the configured ID's as below
- Exclude activity IDs list = Will not generate Inventory History file for the configured ID's
- Username = If given, any activity performed by that user will generate IHT, if left blank will generate for any user who performs the activity

Job Number *	J000000294
Job Type *	Generate Inventory History Extrac
Schedule Name *	WMS Inventory History
Enabled	<input type="checkbox"/>
Schedule Type *	Interval
Every *	1
Period *	minutes
Minute *	
Hour *	
Day Of Week *	
Day Of Month *	
Month Of Year *	
Job Parameters	<i>Include activity IDs list</i> },74,29,30,39,40,49,50,52,53,4,17,19
	<i>Exclude activity IDs list</i> 
	<i>Username</i> oralgfint
	<i>Output File Prefix</i> 
	<i>Number of days</i> 
	<i>Destination folder path</i> 
	<i>Interface Format</i> 

**Figure 5: Include Activity IDs List**

- **NOTE:** - Please make sure the required IHT's are configured in the Include activity IDs list, if missed it will not generate for those, which are not anticipated during configuration

## Output Interface Configuration in WMS

This screen configuration is used to generate output file to single or multiple external systems per interface type. For ICS integration the type used is

- Inventory History Export
- Outbound Loads Export

## Inventory History for Receipt Confirmation

Interface Type	Sequence Nbr	Interface Protocol	URL	Username	Password
Inventory History Export	1	REST Web Service	https://icsappspod-icsapplications.integration.dc1.c9dev2.oraclecorp.com:443/integration/flowapi/rest/OCWMS_RECEIPT_CONFIRMATION/v01/receipt_confirm	prakash.sampath@oracle.com	***

**Figure 6: Inventory for Receipt Confirmation**

The following is an example of a second level detail screen to configure the filter criteria which will generate the file only when the configured activity code is sent for receipt confirmation.

Sequence Nbr	Column name	Sql operator	Column value	Mod User	Mod Timestamp	Create user	Create Timestamp
1	Activity Code	IN	1 4 24 25 51 63 64 72 73 74	oralgint	05/04/2018 5:29:52 AM	oralgint	03/28/2018 4:44:49 AM

**Figure 7: Filter Criteria**

IHT Code configured = 1|4|24|25|51|63|64|72|73|74 (This might vary based on scenarios)

## Inventory History for Inventory Adjustments

Interface Type	Sequence Nbr	Interface Protocol	URL	Username	Password
Inventory History Export	1	REST Web Service	https://icsappspod-icsapplications.integration.dc1.c9dev2.oraclecorp.com:443/integration/flowapi/rest/OCWMS_RECEIPT_CONFIRMATION/v01/receipt_confirm	prakash.sampath@oracle.com	***
Inventory History Export	2	REST Web Service	https://icsappspod-icsapplications.integration.dc1.c9dev2.oraclecorp.com:443/integration/flowapi/rest/OCWMS_INVENTORY_ADJUSTMENT/v01/inv_adj	prakash.sampath@oracle.com	***

**Figure 8: Inventory History**

IHT Code configured = 29|30|39|40|49|50|52|53 (This might vary based on scenarios)



**NOTE** – We can configure the same service with multiple filter criteria based on the need.

Interface Type	Sequence Nbr	Interface Protocol	URL	Username
Inventory Histor...	1	REST Web Service	https://icsappspod-icsapplications.integration.dc1.c9dev2.oraclecorp.com:443/integration/flowapi/rest/OCWMS_RECEIPT_CONFIRMATION/v01/receipt_confirm	prakash.sampath@oracle.com
Inventory Histor...	2	REST Web Service	https://icsappspod-icsapplications.integration.dc1.c9dev2.oraclecorp.com:443/integration/flowapi/rest/OCWMS_INVENTORY_ADJUSTMENT/v01/inv_adj	prakash.sampath@oracle.com
Inventory Histor...	3	REST Web Service	https://icsappspod-icsapplications.integration.dc1.c9dev2.oraclecorp.com:443/integration/flowapi/rest/OCWMS_INVENTORY_ADJUSTMENT/v01/inv_adj	prakash.sampath@oracle.com

**Figure 9: Inventory History – Multiple Criteria**

For example, IHT = 4 is generated during Receipt confirmation for Putaway and during Inventory Adjustments. So the system should differentiate which IHT should be sent to the right service. In that case, configure one more IHT with filter criteria as below for adjustments:

Sequence Nbr	Column name	Sql operator	Column value	Mod User	Mod Timestamp
1	Activity Code	IN	417119	oralgint	05/08/2018 8:59:04 AM
2	Module Name	IN	ActiveInventoryView lbContainerView rf.inbound.cwrfmodcase rf.inbound.cwrfcyclecountlocn rf.inbound.cwrfcyclecounttblpn	oralgint	04/26/2018 10:50:32 AM

**Figure 10: IHT with Filter Criteria**

**NOTE** – Filter criteria has more options to configure based on the business needs.

## Shipment Confirmation for Shipped Load

Interface Type	Sequence Nbr	Interface Protocol	URL
Outbound Loads Export	1	REST Web Service	https://icsappspod-icsapplications.integration.dc1.c9dev2.oraclecorp.com:443/integration/flowapi/rest/OCWMS_SHIPMENT_CONFIRMATION/v01/shipload

**Figure 11: Shipment Confirmation for Shipped Load**